

WHAT IS CLAIMED IS:

1. A method for modifying a portion of a substrate surface, said method comprising:

- 5 (a) producing a solvent layer on said substrate surface;
- (b) selectively protecting at least one site on said substrate surface with a protective bubble; and
- (c) contacting said selectively protected substrate surface with a reactive agent under conditions sufficient for said reactive agent to react with unprotected susceptible moieties present said substrate surface;

10 whereby a portion of said substrate surface is modified.

2. The method according to Claim 1, wherein said method comprises reiterating steps (b) and (c) at least one additional time.

15 3. The method according to Claim 1, wherein said method further comprises removing unreacted reactive agent from said substrate surface following said contact step.

4. The method according to Claim 1, wherein said protective bubble is produced  
20 by a bubble producing means.

5. The method according to Claim 4, wherein said bubble producing means is a heating means.

25 6. The method according to Claim 4, wherein said bubble producing means is a component of said substrate.

7. The method according to Claim 4, wherein said bubble producing means is present on a structure separate from said substrate.

30

8. A method for synthesizing a plurality of polymers on a substrate surface, said

method comprising:

(a) producing a solvent layer on said substrate surface, where said substrate surface has a plurality of individually activatable resistors associated with it;

(b) performing at least two iterations of the following steps:

- 5 (1) selectively protecting at least one site on said substrate surface with a protective bubble by selective activation of said resistors;
- (2) contacting said selectively protected substrate surface with a reactive agent under conditions sufficient for said reactive agent to react with unprotected susceptible moieties present on said
- 10 substrate surface; and
- (3) removing unreacted reactive agent from said substrate surface;
- whereby a plurality of polymers are produced on said substrate surface.

9. The method according to Claim 8, wherein said reactive agent is a deblocking

15 agent.

10. The method according to Claim 8, wherein said reactive agent is an activated monomer.

20 11. The method according to Claim 8, wherein said polymers are nucleic acids.

12. A method for synthesizing a plurality of polymers on a substrate surface, said method comprising:

- (a) producing a solvent layer on said substrate surface;
- 25 (b) performing at least two iterations of the following steps:
- (1) selectively protecting at least one site on said substrate surface with a protective bubble, where said protective bubble is produced by activation of a resistor present on a structure apart from said substrate;
- 30 (2) contacting said selectively protected substrate surface with a reactive agent under conditions sufficient for said reactive agent

to react with unprotected susceptible moieties present on said substrate surface; and

(3) removing unreacted reactive agent from said substrate surface; whereby a plurality of polymers are produced on said substrate surface.

5

13. The method according to Claim 12, wherein said reactive agent is a deblocking agent.

14. The method according to Claim 12, wherein said reactive agent is an activated  
10 monomer.

15. The method according to Claim 12, wherein said polymers are nucleic acids.

16. The method according to Claim 12, wherein said polymers are peptides.  
15

17. A substrate produced according to the method of Claim 1.

18. A polymeric array comprising:  
a plurality of distinct polymers stably associated with the surface of a substrate,  
20 wherein said substrate comprises a plurality of individually activatable resistors  
associated with said surface and at least one of said polymers is associated with at least  
one of said resistors.

19. The polymeric array according to Claim 18, wherein said plurality of resistors  
25 are beneath said surface of said substrate.

20. A nucleic acid array comprising:  
a plurality of nucleic acid spots stably associated with the surface of a  
substrate, wherein said substrate comprises a plurality of individually activatable  
30 resistors beneath said surface and at least one of said nucleic acid spots is associated  
with at least one of said resistors.

21. A kit for producing a polymeric array, said kit comprising:  
a substrate having a plurality of activatable resistors; and  
5 a deblocking agent.
22. The kit according to Claim 21, wherein said kit further comprises a solvent.
23. The kit according to Claim 21, wherein said kit further comprises monomeric  
10 reagents.
24. A method of detecting the presence of an analyte in a sample, said method  
comprising:  
contacting (a) a polymeric array having a plurality of distinct polymers stably  
15 associated with the surface of a substrate, wherein said substrate comprises a plurality  
of individually activatable resistors associated with said surface, with (b) a sample  
suspected of comprising said analyte under conditions sufficient for binding of said  
analyte to a complementary polymer on said array to occur; and  
detecting the presence of binding complexes on the surface of the said array;  
20 whereby the presence of said analyte in said sample is detected.
25. The method according to Claim 24, wherein said polymer is a nucleic acid.
26. The method according to Claim 25, wherein said analyte is a nucleic acid and  
25 said binding is by hybridization.
27. The method according to Claim 24, wherein said method further comprises  
activating at least one of said resistors during at least one of said contacting and  
detecting steps.

30